



(11)

**EP 1 109 380 A2**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**20.06.2001 Bulletin 2001/25**

(51) Int Cl.7: **H04M 1/22**

(21) Application number: 00311280.2

(22) Date of filing: 15.12.2000

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU**  
**MC NL PT SE TR**  
 Designated Extension States:  
**AL LT LV MK RO SI**

- Salomäki, Lauri  
96100 Rovaniemi (FI)
- Liukkonen-olmiala, Tea  
90940 Jääli (FI)
- Hynninen, Tiina  
90500 Oulu (FI)
- Pirkola, Jani  
58212 Linköping (SV)
- Sippola, Leena  
90500 Oulu (FI)
- Tuomela, Sanna  
90500 Oulu (FI)

(30) Priority: 15.12.1999 GB 9929673

(71) Applicant: **NOKIA MOBILE PHONES LTD.**  
**02150 Espoo (FI)**

(72) Inventors:

- **Lustila, Risto**  
96400 Rovaniemi (FI)
- **Kinnunen, Timo**  
92430 Paavola (FI)

(74) Representative: **Slingsby, Philip Roy et al**  
**Page White & Farrer**  
**54 Doughty Street**  
**London WC1N 2LS (GB)**

(54) **Handset**

(57) A communications terminal handset having a translucent outer casing and a light source arranged for illumination of a substantial area of the casing.

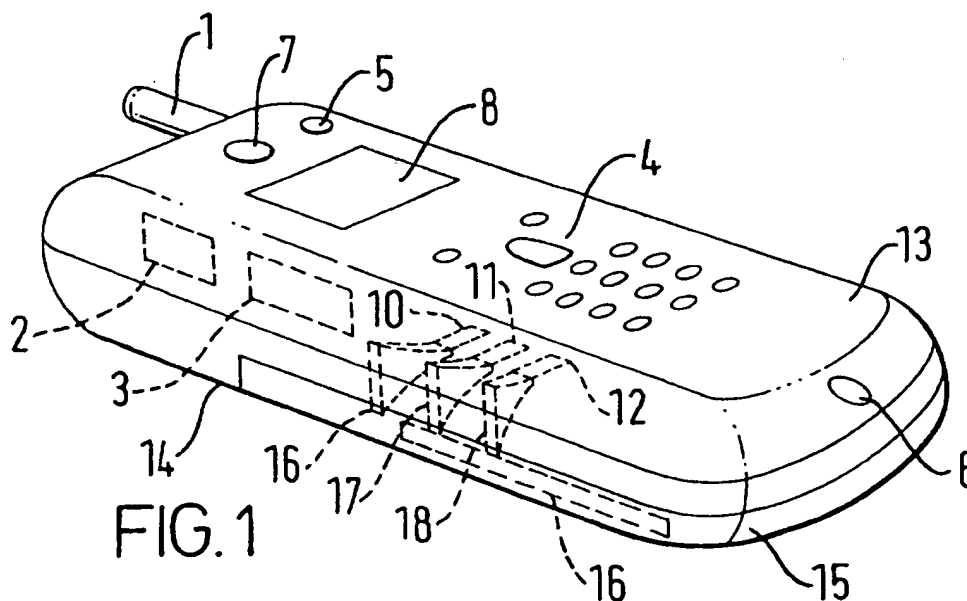


FIG. 1

## Description

[0001] This invention relates to a handset, suitably including means for illumination of its outer cover. The handset may be for a communication terminal such as a mobile telephone.

[0002] Devices such as radio telephones are being developed to provide users with increasing numbers of features, and features of increasing complexity. In order that users remain able to take advantage of these features there is a parallel need to improve the user interfaces of such devices. User interfaces should be made more simple and more intuitive so that even users who have little technical knowledge remain able to control advanced features of such devices.

[0003] As such devices become more commonly used there is also a drive for manufacturers to provide product features that appeal aesthetically to users. Typically, the device has an outer plastic or metal cover whose shape is selected to be aesthetically pleasing. The cover can be pigmented with paint, dye or the like to give it an attractive colour. In addition to the cover, the configuration of other surface parts of the device such as keypads and displays can be selected for eye appeal. However, it can be anticipated that in future demanding purchasers will require more imaginative aesthetic features.

[0004] In the field of portable devices, especially handheld devices, there is a strong drive to reduce the devices' size and weight, so that it is easier for users to carry such devices with them all the time. It is preferred that any solution to the other problems described above is compatible with that drive.

[0005] It is known for telephones to include a small light that flashes when an incoming call is received. It is known for the individual keys of the keypad of a telephone to be illuminated during use of the telephone.

[0006] There is therefore a need for a means whereby the user interface of a device may be enhanced, preferably in conjunction with the provision of additional aesthetic features and preferably without substantial weight or volume increase.

[0007] According to the present invention there is provided a communication terminal handset having a translucent outer casing and a light source arranged for illumination of a substantial area of the casing.

[0008] The light source is suitably capable of illuminating the casing in any of a plurality of colours. The light source is suitably capable of illuminating different portions of the casing in different colours. The light source may comprise one or more individual light emitters such as LEDs or fluorescent devices such as fluorescent tubes.

[0009] The said substantial area is suitably greater than 30% of the exterior surface area of the handset, preferably greater than 40% of the exterior surface area of the handset and most preferably greater than 50% of the exterior surface area of the handset.

[0010] The handset preferably comprises control means for controlling the light source in dependence on a state of the handset. That state may, for example, be any one or more of: whether there is an incoming call to the handset (such a call preferably including a message or voice or data call) and optionally whether that call is unanswered, the detected input to a microphone, a factor internal to the handset and/or the communication terminal such as battery charge or internal temperature, or an external factor such as ambient temperature.

[0011] The light source may be controlled so as to vary the colour and/or intensity and/or spatial pattern of illumination of the cover in dependence on the state of the handset, and optionally to vary any of those features over time in dependence on that status.

[0012] The illumination of the casing may form part of the user interface of the terminal.

[0013] The handset suitably includes diffusion means for diffusing light from the light source for diffuse illumination of the said area of the casing. That means may be a rough inner or outer surface of the cover. The handset is suitably arranged so that the illumination of the casing causes emission of light from the handset over a distributed area of the casing, and preferably substantially all the area of the casing.

[0014] Not all of the cover need be translucent. One or more regions of the cover may be transparent, for instance where the cover overlaps a display of the terminal. The handset may include other covers, suitably covering other regions of the terminal, or the cover may comprise different non-integral parts covering respective regions of the terminal. The casing preferably does not comprise or overlap any keypad of the terminal.

[0015] The casing is preferably rigid. The casing is preferably a protective cover of the terminal. The casing may be a front cover of the terminal. The casing may be user-removable from the terminal.

[0016] The terminal is preferably a mobile terminal such as a mobile telephone and/or a cellular telephone.

[0017] The present invention will now be described by way of example with reference to the accompanying drawings, in which:

figure 1 is a schematic diagram of a mobile terminal; and

figures 2 to 4 illustrate means of illumination of the cover of a mobile terminal.

[0018] The mobile terminal of figure 1 comprises an antenna 1 connected to a radio interface 2 for transmission and reception of signals from a radio network. A control processor 3 is connected to the radio interface whereby the control processor may provide the radio interface with data for transmission to the network, and may receive data from the network. The control processor is connected to input and output apparatus of the terminal, including keypad 4, ringer 5, microphone 6, loudspeaker 7, visual display 8. The control processor

of one or more filters. Other options include ASP sapphire (<http://www.otn.net/sapphire/light/>).

**[0026]** Instead of individual LEDs one or more light emitters having themselves a larger surface area could be used. Such an emitter could be arranged on the inner surface of the cover. Figure 2 shows a cross-section through part of a cover having an emitter 20 disposed on its inner surface. The emitter 20 includes a pair of electrodes 21, 22 and a light-emitting layer 23 between them which extends over at least a substantial part of the inner surface of the cover.

**[0027]** Figure 3 shows an arrangement in which the cover comprises a transparent protective and durable outer shell 30 which includes no diffusion means, and an interior light diffusion layer 31 which receives light from LEDs 32-34. Light diffused by layer 31 passes through transparent shell 30 without further diffusion.

**[0028]** Figure 4 shows an arrangement in which there are a plurality of groups of LEDs coupled to the covers at different locations. In the arrangement of figure 4 the colour of the cover can be different at different locations because of the reduction in the intensity of emission from the cover due to a particular LED with increasing distance from the point at which it is coupled to the cover. In the arrangement of figure 4 the control processor can control the apparent colour of the cover to be different at different locations on the cover. With a change in colour over time this can provide for attractive effects of changing or pulsating colours moving or merging over the cover. These patterns may be used in any of the ways described above for providing information to a user or altering the appearance of the terminal. More than two sets of light sources coupled to the display at different locations may be used.

**[0029]** Static multicolour surfaces may be achieved by using prisms, coloured stickers, templates or the like on the cover to enhance the illuminated effects.

**[0030]** Instead of illuminating all parts of the cover, only one or some parts of the cover, preferably including the front cover, could be illuminated. The illumination preferably excludes any parts of the cover overlying the display. Nevertheless, such parts are likely to be transparent and smooth-surfaced, so light within the cover is unlikely to leak from such parts. Illumination could extend away from the handset - especially when the handset is placed on a surface such as a table.

**[0031]** The applicant draws attention to the fact that the present invention may include any feature or combination of features disclosed herein either implicitly or explicitly or any generalisation thereof, without limitation to the scope of any of the present claims. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention.

## Claims

1. A communications terminal handset having a translucent outer casing and a light source arranged for illumination of a substantial area of the casing.
2. A communications terminal handset as claimed in claim 1, wherein the light source is capable of illuminating the casing in any of a plurality of colours.
3. A communications terminal handset as claimed in claim 1 or 2, wherein the light source is capable of illuminating different portions of the casing in different colours.
4. A communications terminal handset as claimed in any preceding claim, wherein the said substantial area is greater than 30% of the exterior surface area of the handset.
5. A communications terminal handset as claimed in any preceding claim, comprising control means for controlling the light source in dependence on a state of the telephone handset.
6. A communications terminal handset as claimed in claim 5, wherein the control means is capable of controlling the light source in dependence on whether there is an incoming unanswered call to the telephone handset.
7. A communications terminal handset as claimed in claim 5 or 6, wherein the control means is capable of controlling the light source in dependence on a sensed environmental or internal factor of the telephone.
8. A communications terminal handset as claimed in any preceding claim, including diffusion means for diffusing light from the light source for diffuse illumination of the said area of the casing.
9. A communications terminal handset as claimed in claim, wherein the light source comprises a plurality of light generators.
10. A communications terminal handset as claimed in claim 9, wherein each light generator is a light emitting diode.
11. A communications terminal handset as claimed in claim 9 or 10, including a plurality of light guide means, each for guiding light from a respective light generator to the casing.
12. A communications terminal handset as claimed in claim 11, wherein at least one of the light guide means is arranged for optical connection to the cas-

ing at a location spaced from that at which another of the light guide means is arranged for optical connection to the casing.

5

10

15

20

25

30

35

40

45

50

55

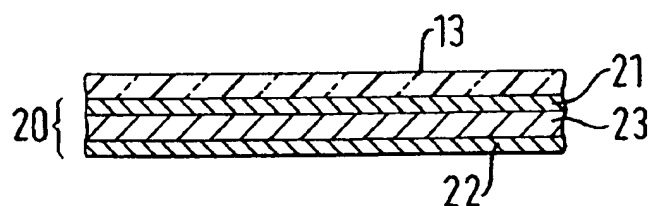
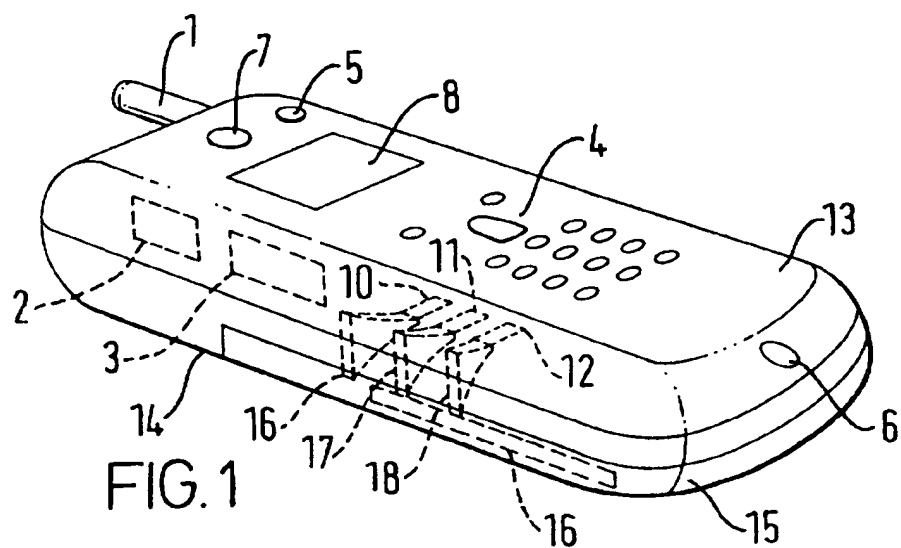


FIG. 2

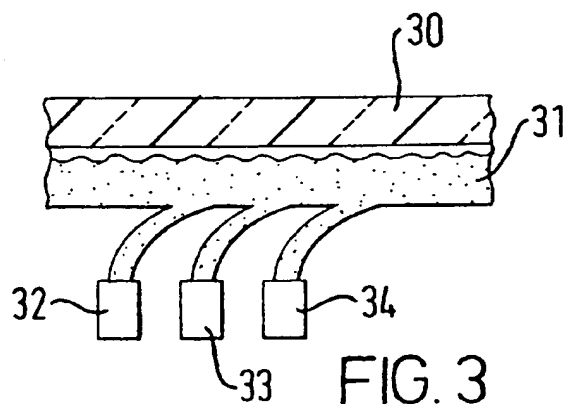


FIG. 3

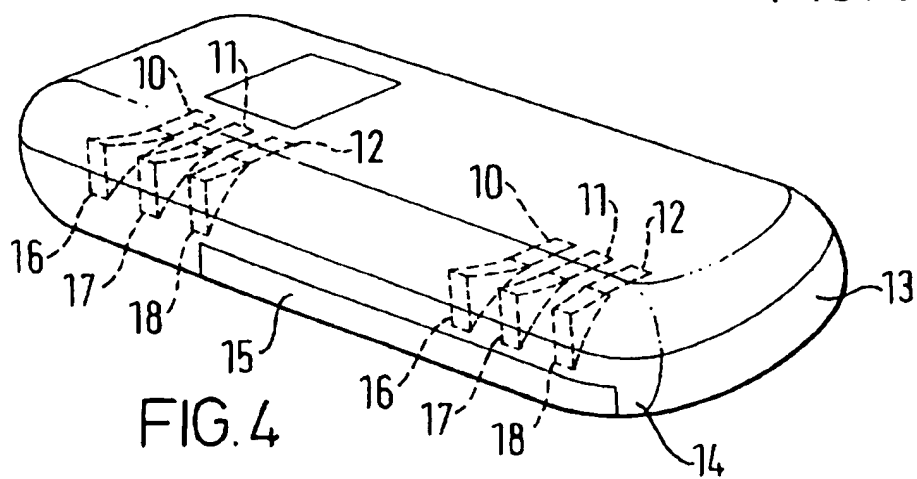


FIG. 4